

RESPONSE TRANSMITTAL AND FEE AUTHORIZATION

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ATTORNEY DOCKET NO. 15162/00200		APPLICATION NO. 09/255,352	
FILING DATE February 23, 1999	CONFIRMATION NO. 8382	CUSTOMER NO. 24367	EXAMINER Mohammad Ali
GROUP ART UNIT 2177			
INVENTOR(S): Sumiyo TANAKA			
TITLE OF INVENTION: IMAGE SEARCHING SYSTEM, IMAGE SEARCHING METHOD, AND RECORDING MEDIUM STORING AN IMAGE SEARCHING PROGRAM			

MS APPEAL BRIEF-PATENTS

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- ☒ (A) A response to the Office Action dated: April 21, 2003
- ☐ (B) A Petition for Extension of Time
☐ for 1 month ☐ for 2 months ☐ for 3 months;
A Petition for Extension of Time, having been previously filed,
☐ for 1 month ☐ for 2 months ☐ for 3 months
- ☐ (C) A Notice of Appeal. \$
- ☒ (D) An Appellant's Brief on Appeal. \$330.00
- ☐ (E) Other: \$
- ☐ (F) A verified statement to establish small entity status under 37 CFR §§ 1.9 and 1.27
- ☐ Small entity status under 37 CFR § 1.27 has been previously established
- ☐ The claims fee, if any, has been calculated as shown below

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TOTAL		MINUS		
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x \$43	
+ \$145	
TOTAL ADD'L FEE	\$ 0.00

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Technology Center 2100

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12/18/03
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application No.: 09/255,352
Applicant: Sumiyo TANAKA
For: IMAGE SEARCHING SYSTEM, IMAGE SEARCHING
METHOD, AND RECORDING MEDIUM STORING AN
IMAGE SEARCHING PROGRAM
Confirmation No.: 8382
Customer No.: 24367
Docket No.: 15162/00200
Filed: February 23, 1999
Group Art Unit: 2177
Examiner: Mohammad Ali

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12/10/2003 DTESSEM1 00000108 181260 09255352

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BRIEF FOR APPELLANT

This is an appeal from the Final Rejection dated April 21, 2003, rejecting claims 1-32 in the present Application. In addition, claim 33 is objected to as depending from a

Application No. 09/255,352
Appeal Brief dated December 3, 2003
Reply to Office Action of April 21, 2003

rejected claim. A Notice of Appeal was filed on October 9, 2003 resulting in an Appeal Brief due date of December 9, 2003.

This brief is submitted in triplicate.

This brief is accompanied by a Response Transmittal and Fee Authorization, authorizing the requisite fee of \$330.00 as set forth in § 1.17(c). In the event that the Response Transmittal and Fee Authorization is not enclosed, please charge any required fee (other than an issue fee) during the pendency of this Application to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260. Please credit any excess payment to the same account.

If an extension of time is required to enable this document to be timely filed and there is no separate Petition for Extension of Time filed herewith, this document is to be construed as also constituting a Petition for Extension of Time under 37 CFR § 1.136(a) for a period of time sufficient to enable this document to be timely filed. Any fee required for such Petition for Extension of Time and any other fee required by this document pursuant to 37 CFR §§ 1.16 and 1.17, other than an issue fee, and not submitted herewith should be charged to Sidley Austin Brown & Wood LLP's Deposit Account 18-1260. Any refund should be credited to Deposit Account 18-1260.

REAL PARTY IN INTEREST (37 C.F.R. § 1.192(c)(1))

The real party in interest in the present Application is Minolta Co., Ltd., a corporation of Japan, having an office at Osaka Kokusai Building, 3-13, 2-Chome, Azuchi-Machi, Chuo-Ku, Osaka-Shi, Osaka 541, Japan.

RELATED APPEALS AND INTERFERENCES (37 C.F.R. § 1.192(c)(2))

There are no related appeals or declared interferences which will directly affect or be directly affected by the present Application to the knowledge of the undersigned.

STATUS OF CLAIMS 37 C.F.R. § 1.192(c)(3)

This Application was filed as U.S. Application Serial No. 09/255,352 on February 23, 1999, and claims priority from Japanese Patent Application No. 10-41989, filed February 24, 1998.

The Application was filed with thirty (30) claims. Appellants added claims 31-33 in an amendment filed November 5, 2001. Claims 1-32 stand rejected and are the subject of this appeal. Claim 33 stands objected to as depending from a rejected claim. Claims 1-33, a total of 33 claims, are now pending.

The status of the claims is, therefore, believed to be as follows:

Allowed claims: none

Claims objected to: 33

Claims rejected: 1-32

Appellants hereby appeal the Examiner's final rejection of claims 1-32 in this matter which presently stand rejected over the cited references of record.

Claims 1-33, as amended, are set forth in Appendix A (attached hereto) pursuant to 37 C.F.R. § 1.192(c)(9).

STATUS OF AMENDMENTS (37 C.F.R. § 1.192(c)(4))

No amendments were filed by Appellants in their Response filed on August 21, 2003 to the Final Office Action dated April 21, 2003. Therefore, there are no outstanding amendments that have not been entered.

SUMMARY OF INVENTION (37 C.F.R. § 1.192(c)(5))

The present invention relates to a system and method for searching a database of electronic images to find a desired image. To begin a search for one or more images, the user selects a plurality of images similar to the desired image (step S41 (Figure 6)). Feature quantities for the selected images are then retrieved from the database 50. Feature quantities include color, shape, texture, *etc.* Next, a feature quantity compilation process is used to compile the common feature quantities for the selected images.

The common feature quantities are determined by calculating the differences among corresponding feature quantities between each of the selected images (S431). Then a mean value of the differences is determined (S432). Every feature where the mean value of the differences is less than a threshold is selected as a common feature quantity (S433).

The common feature quantities extracted from the plurality of selected images are then compared to the feature quantities for each of the images in database 50 to calculate a degree of similarity for each image (S46). Those images having a degree of similarity higher than a threshold values are deemed similar to the key images and are output to the screen in order of similarity.

ISSUES PRESENTED FOR REVIEW (37 C.F.R. § 1.192(c)(6))

Issue No. 1: Claims 1-32 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,246,804 B1 to Sato et al ("Sato"). Thus, the issue is whether the teachings of this reference show, expressly or inherently, all of the limitations of the claims.

GROUPING OF CLAIMS (37 C.F.R. § 1.192(c)(7))

In regard to Issue No. 1, in order to make the appeal process as efficient as possible and for the purposes of this Appeal only, Appellants agree to have the claims of Issues No. 1 considered in three groups:

a first group consisting of Claims 1-10 and 33, which stand or fall together;

a second group consisting of Claims 11-20 and 31, which stand or fall together;
and

a third group consisting of 21-30 and 32, which stand or fall together.

The reasons why the above three groups are considered separately patentable are presented in the appropriate part of the argument provided pursuant to 37 C.F.R. § 1.192(c)(8).

ARGUMENT (37 C.F.R. § 1.192(c)(8))

As this Appeal concerns rejections only under 35 U.S.C. §§102 and 103, this section includes only arguments pursuant to 37 C.F.R. § 1.192(c)(8)(iii) and 37 C.F.R. § 1.192(c)(8)(iv).

A. Cited References

The Examiner relied upon one reference in the Final Office Action: Sato. In order to avoid undue repetition of background information and needless restatements as to the subject matter of this reference, a discussion of the references is provided here.

For each respective discussion of the above reference in view of the aforesaid issue, a shorter treatment of the appropriate references shall be provided. Where

appropriate, the reader will be referred back to this section to review a reference, if necessary.

1. The Sato Patent

The Sato patent is directed to an image retrieval apparatus and method which processes a single target image to provide search criteria for searching an image database 109 (column 6, lines 4-7). A single image is selected as the designate image 100.

Referring to FIG. 2, reference numeral 100 denotes an image (to be referred to as a designated image hereinafter) for designating an image as a search target from the image files 109. The designated image 100 is stored in the designated image memory 101. A single region processing unit 102 refers to the description files 110 which describes the contents of each image data in the image files 109 using the feature of the image data to discriminate if each region included in the image data is included in the designated image 100. If the region is included in the image 100, the unit 102 adds the description information of the region of the image data and information of a movable region of the designated image 100 to the single region memory 103. Reference numeral 104 denotes a compound region processing unit for discriminating if a condition that the designated image 100 simultaneously contains all regions of image data constituting a compound region is satisfied. If the image 100 simultaneously contains all the regions, the unit 104 adds the description information of the regions and information of a movable region of the designated image 100 to the compound region memory 105. (column 6, lines 4-24, emphasis added)

Thus, it is clear that the search process of the Sato patent uses a single key image for comparison against the image files 109. Individual regions of the image files 109 are compared to corresponding regions in the designated image 100 using the description files 110 for each image (column 6, lines 39-50). When a relative match is detected, the region information is added to a compound region memory 106, which provides a compound region for further comparison to the data from the description files.

B. Issue One

The claims 1-32 stand rejected under 35 U.S.C. § 102(e) as being anticipated by the Sato Patent.

1. Group I

In contrast to the cited prior art, Claim 1 includes:

an image database storing a plurality of database images, each of said plurality of database images having a plurality of features;

a specifying controller for specifying **a plurality of key images**, each of said plurality of key images being specified by a user and having a respective plurality of features;

an extracting controller for extracting common key image feature values for **common key image features that are common to the plurality of key images**;

a calculating controller for **comparing the common key image feature values, extracted by the extracting controller, with the respective feature values of the plurality of database images** to thereby sequentially calculate similarities between each of the common key image feature values and respective ones of the database image feature values for each of the plurality of database images; and

a searching controller for retrieving from the database at least one of the plurality of database images which is similar to the plurality of key images, based on a similarity calculated by the calculating controller.

Claim 1 includes the limitation that the searching system includes a specifying controller for specification of a plurality of key images to determine search criteria. The cited reference only designates a single image (the designated image 100) for the extraction of search criteria. Thus, the cited prior art does not show or suggest "a specifying controller for specifying **a plurality of key images.**"

In addition, claim 1 includes the limitation that the extracting controller extracts common key image features from the plurality of key images. The invention of claim 1 provides greater image search accuracy by determining which image features are common in a selected set of key images (written description, page 31, line 16, to page 32, line 6).

Because the Sato patent uses a single designated image to derive search criteria, it cannot show or suggest determining common features between a plurality of images to provide search criteria. The term "common key image features" is nonsensical when there is only one designated image. In the cited prior art, the designated image has no other image with which to have anything in common. Thus, the cited prior art does not show or suggest "an extracting controller for extracting common key image feature values for **common key image features that are common to the plurality of key images.**"

In the Office Action dated April 21, 2003, it is argued that:

First, Applicant argues that Sato does not teach, "a specifying controller for specifying a plurality of key images".

In response to Applicant's arguments, the Examiner respectfully submits that in particular, Sato teaches this limitation as specifying a controller (Fig. 1) for storing plurality of images in a plurality of features in the image file. Each features of image has designated color, size of the color (key) etc (Abstract, lines 1-9). Hence, Applicant's claimed specifying controller for specifying a plurality of key images are similar to Sato's specifying controller for specifying a plurality of key images.

The material cited by the Examiner does not support this position. Lines 1-9 of the Abstract state:

An image retrieval method and apparatus for searching a plurality of images stored in an image file for a desired image are disclosed. When a **designated image** for designating an image to be retrieved for is input, and its color is designated, the sizes and colors are **compared between** description information which stores the feature of each of regions obtained by dividing **each of images to be searched** stored in the image file, and feature data of **the designated image**. (Emphasis Added.)

It is additionally stated in the Sato patent:

Referring to FIG. 2, reference numeral 100 denotes an image (to be referred to as a designated image hereinafter) for designating an image as a search target from the image files 109. The designated image 100 is stored in the designated image memory 101.

This passage clearly shows that a single designated image is specified for providing search criteria to be compared to a plurality of images in the image file. In contrast, in claim 1, a plurality of images is specified, common key image features are extracted from those specified images, and those common key image features are then compared to a database of images to retrieve those images with features similar to the common key image features. The only image specified to provide search criteria in the Sato patent is the single designated image. Thus, Sato does not show or suggest this limitation of the claims.

The Office Action further argues:

Second, Applicant argues that Sato does not teach, “an extracting controller for extracting common key images feature values for common key image features that are common to the plurality of key images and image search criteria”.

In response to Applicant’s arguments, the Examiner respectfully submits that in particular, Sato teaches this limitation as stated above and image search from regions and extracting a plurality of images from correctly matched (common) (col. 14, lines 1-4, Fig. 21). Hence, Applicant’s claimed extracting common key images and search criteria are similar to Sato’s extracting common key images and image searching.

The passage cited by the Examiner does not show or suggest extracting common key image features for use as search criteria, it describes the actual searching process. As noted at column 13, line 57 – column 14, line 4:

When a portion of an image is input as a designated image, the designated image is divided into a plurality of regions, a plurality of regions with different colors (a single color in each region) are generated by polygonal approximation of the boundary lines of the regions, thus generating a plurality of images (figures). As a result, even when a portion of an image is input as a designated image, image data including the designated image can be retrieved using these image portions.

As described above, according to this embodiment, since processing for a compound region as a combination of a plurality of regions is performed together with processing for a single region, an image to be searched which is divisionally extracted as a plurality of regions can be correctly matched. **(Emphasis Added.)**

Thus, the single designated image is divided into a plurality of regions and each individual pattern is processed (301-304) to provide single region information for that portion of the designated image (Figure 21). There is no suggestion to extract common features from the individual portions and there can be no common features between images because there is only one designated image. The reference simply does not show or suggest "extracting common key image feature values for common key image features that are common to the plurality of key images."

It is further argued:

Third, Applicant argues that Sato does not teach, "specifying a plurality of key images, determining common feature values of those key images and comparing those common feature values to an image database".

In response to Applicant's arguments, the Examiner respectfully submits that in particular, Sato teaches this limitation as stated above and searching a plurality of images stored in an image file for a desired image are disclosed. When a designated image for designating an image to be retrieved for is input, and its color is designated, the sizes and colors are compared between description information which stores the feature of each of regions obtained by dividing each of images to be searched stored in the image file, and feature data of the designated image. The regions, which are determined to be included in the designated image, of image data are obtained, and the similarities between the obtained regions of image data and the designated image are calculated (Abstract, lines 1-12 et seq). Hence, claimed comparing common feature values to an image database are similar to Sato's comparing common features in the database in image file.

This explanation is not logical. This describes the entire search process in the Sato reference, not a process for determining search criteria. In summary, the cited reference does not show or suggest several limitations to the claims, no matter how much the reference is contorted.

To summarize the process shown in Sato, a designated image is selected 100 and stored in the designated image memory 101. Single region processing unit 102 compares regions of designated image 100 to region data for the image database 109, which are stored in description files 109 (column 6, lines 39-54). When matches are found, they are

stored in the compound memory to further refine the matching process (column 6, lines 54-67). The maximum value selection unit 106 determines the similarity between the designated image and the compound data from the image files and generates a similarity value for that image (column 7, lines 1-9). Those images closest in similarity to the designated image are selected from the image file 109 as best matches. This is the entire searching process of the Sato reference.

In contrast to the one designated image that is parsed and processed to provide search criteria in the Sato reference, the invention of claim 1 starts with the specification of a plurality of images (S41) to provide search criteria. These images are compared to one another to derive common key features among the specified images (S43). These common key features are then compared to the image database and the images from the database are selected based on their similarity to the common key features (S44-S47). The Examiner is apparently confusing the common key features extraction process with the entire search process of the Sato reference, although the process of the Sato reference never extracts any common key features for any purpose. The Sato reference only uses one designated image as the source for search criteria. The Sato reference does not show or suggest a user specified plurality of images, extracting common key features between the user specified plurality of images to provide search criteria and comparing those common key features to an image database to determine best matches.

A claim is anticipated only if every limitation of the claim is shown or suggested in the cited reference.

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). “The identical invention must be shown in as complete detail as is contained in the ... claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). (MPEP § 2131)

Because the cited reference does not show or suggest the quoted limitations, claim 1 is not anticipated by the cited prior art. Claims 2 and 3 are dependent upon claim 1 and thus include every limitation of claim 1. Therefore, claims 1-3 are not anticipated by the cited prior art.

Also, in contrast to the cited prior art, claim 4 includes:

- a specifying controller for specifying a plurality of key images used to specify search conditions, each of said plurality of key images being specified by a user and having a plurality of key image features, each of said plurality of key images having a common feature value for each of said plurality of key image features;

- a calculating controller for comparing the plurality of key images, specified by the specifying controller, with the plurality of database images to thereby calculate similarities between the common feature value for each of the plurality of key image features and a corresponding one of the plurality of database image features for each of the plurality of database images;

As noted above, the cited prior art does not show or suggest an apparatus that selects a plurality of key images and determines the common features of the key images in order to provide image search criteria. Therefore, claim 4 is not anticipated by the cited prior art. Claims 5 and 6 are dependent upon claim 4 and thus include every limitation of claim 4. Therefore, claims 4-6 are not anticipated by the cited prior art.

Also in contrast to the cited prior art, claim 7 includes:

- a specifying controller for specifying a plurality of key images specified by a user for specifying search conditions;

- a first calculating controller for comparing a feature value calculated for each common feature of the plurality of key images to thereby calculate a first degree of similarity for each of said plurality of database images;

As noted above, the cited prior art does not show or suggest an apparatus that selects a plurality of key images and determines the common features of the key images in order to provide image search criteria. Therefore, claim 7 is not anticipated by the cited

prior art. Claims 8-10 are dependent upon claim 7 and thus include every limitation of claim 7. Therefore, claims 7-10 are not anticipated by the cited prior art.

2. Group II

Also in contrast to the cited prior art, claim 11 includes:

- specifying a plurality of key images specified by a user for specifying search conditions;
- extracting common feature values from the plurality of key images;
- comparing the common feature values with the feature values of the plurality of database images to thereby sequentially calculate similarities between the common feature values and the database image feature values;

The cited prior art does not show or suggest a method including specifying a plurality of key images, determining common feature values of those key images and comparing those common feature values to an image database. The cited prior art designates a single image and then compares regions of that image to regions of the database images. Determining the common features of a single image is a non sequitur. There is no suggestion of determining any common features between the regions in the cited prior art. Therefore, the cited prior art does not show or suggest every element of claim 11. Claims 12 and 13 are dependent upon claim 11 and thus include every limitation of claim 11. Therefore, claims are not anticipated by the cited prior art.

Also in contrast to the cited prior art, claim 14 includes:

- specifying a plurality of key images specified by a user for specifying search conditions, said plurality of key images having common features, said common features of said plurality of key images each having a key image feature value;
- comparing the key image feature values of the plurality of key images with the plurality of database feature values of the plurality of database images to thereby calculate similarities between the key image feature values and the plurality of database image feature values;

As noted above, the cited prior art does not show or suggest selecting a plurality of key images and determining the common features of the key images in order to provide

image search criteria. Therefore, claim 14 is not anticipated by the cited prior art. Claims 15 and 16 are dependent upon claim 14 and thus include every limitation of claim 14. Therefore, claims 14-16 are patentably distinct from the cited prior art.

Claim 17 is directed to an image searching method which comprises the steps of:

- specifying a plurality of key images specified by a user for specifying search conditions, said plurality of key images each having a plurality of common feature values, each of said common feature values corresponding to one of the features of the plurality of key images;
- comparing the common feature values of the plurality of key images with respective feature values of the plurality of database images to thereby calculate first similarities therebetween;

As noted above, the cited prior art does not show or suggest selecting a plurality of key images and determining the common features values of the key images in order to provide image search criteria. Therefore, claim 17 is not anticipated by the cited prior art. Claims 18-20 are dependent upon claim 17 and thus include every limitation of claim 17. Therefore, claims 17-20 are patentably distinct from the cited prior art.

Also in contrast to the cited prior art, claim 31 includes the limitations of:

- specifying a plurality of key images specified by a user for specifying search conditions, said plurality of key images each having a plurality of key image features each corresponding to at least one of a plurality of database features, said plurality of key images having a plurality of common features which are common to all of the plurality of key images;
- calculating common key image feature values from the common features for each of the plurality of key images;
- comparing the common feature values of the common features with corresponding database image features of the plurality of database images to calculate similarities therebetween;

The cited prior art does not show or suggest specifying a plurality of key images, calculating the common features of the key images and comparing the common features to the database image features. The cited prior art designates a single image and then

compares regions of that image to regions of the database images. Therefore, claim 31 is patentably distinct from the cited prior art.

3. Group III

Also in contrast to the cited prior art, claim 21 includes

- instructions for specifying a plurality of key images specified by a user for specifying search conditions;
- instructions for extracting common feature values of features of the plurality of key images;
- instructions for comparing the common feature values with feature values of the plurality of database images to thereby sequentially calculate similarities between the common feature values of the plurality of key images and the database image feature values;

The cited prior art does not show or suggest a software program including instructions for specifying a plurality of key images, extracting common feature values and comparing the extracted common feature values to the database images. Therefore, claim 21 is patentably distinct from the cited prior art. Claims 22 and 23 are dependent upon claim 21 and thus include every limitation of claim 21. Therefore, claims 21-23 are not anticipated by the cited prior art.

Also in contrast to the cited prior art, claim 24 includes:

- instructions for specifying a plurality of key images specified by a user having common feature values used to specify search conditions;
- instructions for comparing the plurality of key images with the plurality of database images to thereby calculate similarities between common feature values of the plurality of key images and the database image feature values;

The cited prior art does not show or suggest a software program including instructions for specifying a plurality of key images having common feature values and comparing the extracted common feature values to the database images. Therefore, claim 24 is patentably distinct from the cited prior art. Claims 25 and 26 are dependent

upon claim 24 and thus include every limitation of claim 24. Therefore, claims 24-26 are not anticipated by the cited prior art.

Also in contrast to the cited prior art, claim 27 includes:

- instructions for specifying a plurality of key images specified by a user for specifying search conditions, said plurality of key images each having a plurality of features;
- instructions for calculating feature values for each of the plurality of key images from the plurality of features for each of the plurality of key images;
- instructions for comparing the feature values of each of the plurality of key images with respective feature values of the plurality of database images to thereby calculate first similarities between the feature values of the plurality of key images and the feature values of the plurality of database images;

The cited prior art does not show or suggest a software program including instructions for specifying a plurality of key images, extracting common feature values and comparing the extracted common feature values to the database images. Therefore, claim 27 is patentably distinct from the cited prior art. Claims 28-30 are dependent upon claim 27 and thus include every limitation of claim 27. Therefore, claims 28-30 are not anticipated by the cited prior art.

Also in contrast to the cited prior art, claim 32 provides a computer program product including the steps of:


- specifying a plurality of key images specified by a user for specifying search conditions;
- calculating common feature values of the plurality of key images by comparing the plurality of key image features for each of the key images to determine feature values which are common to all of the plurality of key images;
- comparing common feature values of the plurality of key images with the database image feature values of the plurality of database images to calculate similarities therebetween;

The cited prior art does not show or suggest specifying a plurality of key images, calculating the common features of the key images and comparing the common features to the database image features. The cited prior art designates a single image and then compares regions of that image to regions of the database images. Therefore, claim 32 is patentably distinct from the cited prior art.

C. Conclusion

In view of the foregoing, no case for anticipation nor a *prima facie* case of obviousness has been established with regard to either of Claims 1 and 5. Accordingly, the Appellant respectfully requests the Board of Patent Appeals and Interferences to reverse the Examiner's rejections as to all of the appealed claims.

Respectfully submitted,

By: 

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December 3, 2003

APPENDIX A
(37 C.F.R. § 1.192(C)(9))

1. (Previously Presented) An image searching system comprising:
 - an image database storing a plurality of database images, each of said plurality of database images having a plurality of features;
 - a specifying controller for specifying a plurality of key images, each of said plurality of key images being specified by a user and having a respective plurality of features;
 - an extracting controller for extracting common key image feature values for common key image features that are common to the plurality of key images;
 - a calculating controller for comparing the common key image feature values, extracted by the extracting controller, with the respective feature values of the plurality of database images to thereby sequentially calculate similarities between each of the common key image feature values and respective ones of the database image feature values for each of the plurality of database images; and
 - a searching controller for retrieving from the database at least one of the plurality of database images which is similar to the plurality of key images, based on a similarity calculated by the calculating controller.

2. (Previously Presented) An image searching system as claimed in Claim 1, wherein the extracting controller includes:
 - an extracting algorithm for extracting a plurality of types of features from the plurality of key images specified by the specifying controller;
 - a selecting algorithm for comparing the plurality of types of features extracted by the extracting algorithm, with the plurality of key images specified by the specifying controller to thereby select at least one of the types of the features; and
 - a determining algorithm for determining the common key image features based on the at least one type of the features selected by the selecting algorithm.

3. (Previously Presented) An image searching system as claimed in Claim 2, wherein the selecting algorithm is operable to compare common types of the features of respective ones of the plurality of key images specified by the specifying controller,

wherein the determining algorithm is operable to calculate an average similarity value for the features of the plurality of key images with respect to the at least one type of the features selected by the selecting algorithm to thereby determine the average similarity value for each of the at least one type of the features.

4. (Previously Presented) An image searching system which comprises:
an image database storing a plurality of database images to be searched, each of said plurality of database images having a plurality of database image features;

a specifying controller for specifying a plurality of key images used to specify search conditions, each of said plurality of key images being specified by a user and having a plurality of key image features, each of said plurality of key images having a common feature value for each of said plurality of key image features;

a calculating controller for comparing the plurality of key images, specified by the specifying controller, with the plurality of database images to thereby calculate similarities between the common feature value for each of the plurality of key image features and a corresponding one of the plurality of database image features for each of the plurality of database images;

a selecting controller for retrieving a particular key image from the specified plurality of key images based on the similarities calculated by the calculating controller; and

a searching controller for retrieving images from the plurality of database images based on the similarity between the particular key image, selected by the selecting controller, and the plurality of database images.

5. (Previously Presented) An image searching system as claimed in Claim 4, wherein the selecting controller is operable to select as a particular one of the plurality of

key images, a particular one of the plurality of key images which most resembles an image being searched for.

6. (Previously Presented) An image sensing system as claimed in Claim 5, wherein the calculating controller is operable to calculate the types of the features of the plurality of key images and then operable to calculate degrees of similarity by comparing the key image features for each of the plurality of key images with corresponding database feature quantities of the database images for each type of the features,

wherein the selecting controller selects, as the particular key image, a one of the plurality of key images which most resembles an image being searched for with respect to an average value of the degrees of similarity calculated by the calculating controller for each type of the features.

7. (Previously Presented) An image searching system which comprises:
an image database storing a plurality of database images;
a specifying controller for specifying a plurality of key images specified by a user for specifying search conditions;

a first calculating controller for comparing a feature value calculated for each common feature of the plurality of key images to thereby calculate a first degree of similarity for each of said plurality of database images;

a second calculating controller for selecting a particular key image from the plurality of key images and for comparing the particular key image with the plurality of database images to thereby calculate a second degree of similarity for each of the plurality of database images;

a third calculating controller for calculating a final degree of similarity for each of said plurality of database images for use in searching based on the first and second degrees of similarity calculated respectively by the first and second calculating controllers; and

a searching controller for retrieving at least one of the plurality of database images, which is similar to the particular key image, based on the final degree of similarity calculated by the third calculating controller for each of the plurality of database images.

8. (Previously Presented) An image searching system as claimed in Claim 7, wherein the third calculating controller is operable to increase a weight of the first degree of similarity, calculated by the first calculating controller, to a value greater than that of the second degree of similarity, calculated by the second calculating controller, to thereby calculate the final degree of similarity.

9. (Previously Presented) An image searching system as claimed in Claim 8, wherein the first calculating controller is operable to extract common features of the image that are common to all of the key images, and to compare those common features with respective database image features of each of the plurality of database images to thereby calculate the first degree of similarity.

10. (Previously Presented) An image searching system as claimed in Claim 9, wherein the second calculating controller is operable to select from the plurality of key images a key image most similar to a desired image and to calculate the second degree of similarity for each of the database images.

11. (Previously Presented) An image searching method which comprises the steps of:

- storing a plurality of database images in a database;
- specifying a plurality of key images specified by a user for specifying search conditions;
- extracting common feature values from the plurality of key images;
- comparing the common feature values with the feature values of the plurality of database images to thereby sequentially calculate similarities between the common feature values and the database image feature values; and

retrieving from the plurality of database images at least one of the plurality of database images which is similar to the plurality of key images based on the similarities for each of the plurality of database images.

12. (Previously Presented) An image searching method as claimed in Claim 11, wherein the extracting step includes the sub-steps of:
extracting a plurality of types of features from the plurality of key images;
comparing the features from among the plurality of key images to thereby select at least one of the types of the features; and
determining common features based on the at least one type of the features.

13. (Previously Presented) An image searching method as claimed in Claim 12,
wherein the step of comparing includes comparing features of the plurality of key images, and
wherein the step of determining includes calculating an average value of the features of the plurality of key images with respect to the types of the features to thereby determine a calculated average value as representing the common features.

14. (Previously Presented) An image searching method which comprises the steps of:
storing a plurality of database images in an image database, said plurality of database images each having a plurality of database feature values;
specifying a plurality of key images specified by a user for specifying search conditions, said plurality of key images having common features, said common features of said plurality of key images each having a key image feature value;
comparing the key image feature values of the plurality of key images with the plurality of database feature values of the plurality of database images to thereby calculate similarities between the key image feature values and the plurality of database image feature values;

retrieving a particular key image from the plurality of key images based on the similarities; and

retrieving images from the database images based on the similarity between the particular key image and the plurality of database images.

15. (Previously Presented) An image searching method as claimed in Claim 14,

wherein the step of specifying includes selecting as a particular one of the specified plurality of key images the key images which most resemble the database images being searched for.

16. (Previously Presented) An image searching method as claimed in Claim 15,

wherein the calculating controller is operable to calculate a plurality of types of the features from the plurality of key images to derive the common feature values and then to calculate a degree of similarity by comparing the common feature values of each type of feature with corresponding feature values of the plurality of database images for each type of feature, and

wherein the selecting controller selects, as the particular key image from the specified plurality of key images, the key images which most resemble the plurality of database images being searched with respect to an average value of degrees of similarities calculated by the calculating controller for each type of the features.

17. (Previously Presented) An image searching method which comprises the steps of:

storing a plurality of database images in an image database;

specifying a plurality of key images specified by a user for specifying search conditions, said plurality of key images each having a plurality of common feature values, each of said common feature values corresponding to one of the features of the plurality of key images;

comparing the common feature values of the plurality of key images with respective feature values of the plurality of database images to thereby calculate first similarities therebetween;

selecting a particular key image from the plurality of key images and comparing the particular key image with the plurality of database images to thereby calculate second similarities therebetween;

calculating a final similarity for use in searching based on the first and second similarities; and

retrieving one of the plurality of database images, which is similar to the particular key image, based on the final similarity.

18. (Previously Presented) An image searching method as claimed in Claim 17, wherein the step of calculating includes a step of increasing a weight of a degree of the first similarity to a value greater than that of a degree of the second similarity to thereby calculate the final similarity.

19. (Previously Presented) An image searching method as claimed in Claim 18, wherein the step of comparing includes the step of extracting the features of the image which are common to all of the key images, and comparing the common feature values of those common features with respective feature values of each of the database images to thereby calculate the first similarities.

20. (Previously Presented) An image searching method as claimed in Claim 19, wherein the step of selecting includes selecting the key images most similar to the database image and to calculate the second similarity.

21. (Previously Presented) A software program including computer-executable instructions stored on a recording medium, said program comprising:

instructions for storing a plurality of database images in a database;

instructions for specifying a plurality of key images specified by a user for specifying search conditions;

instructions for extracting common feature values of features of the plurality of key images;

instructions for comparing the common feature values with feature values of the plurality of database images to thereby sequentially calculate similarities between the common feature values of the plurality of key images and the database image feature values; and

instructions for retrieving from the plurality of database images at least one of the database images which is similar to one of the key images based on the similarities.

22. (Previously Presented) A software program including computer-executable instructions stored on a recording medium as claimed in Claim 21, wherein the instruction for extracting includes an instruction for extracting a plurality of types of the features from respective key images;

an instruction for comparing the feature values for the extracted types of features of each one of the plurality of key images with the feature values for the extracted types of features for each of the plurality of key images to thereby select at least one of the types of the features; and

an instruction for determining the common feature values based on the at least one type of the features.

23. (Previously Presented) A software program including computer-executable instructions stored on a recording medium as claimed in Claim 22,

wherein the instruction for comparing compares the features of same types among the plurality of key images, and

wherein the instruction for determining calculates an average value of the features of each of the plurality of key images with respect to the types of the features to thereby determine the calculated average value as the common feature values.

24. (Previously Presented) A software program including computer-executable instructions stored on a recording medium, said program comprising:

instructions for storing a plurality of database images in an image database, wherein said instructions for storing also include instructions for storing a plurality of database image feature values for each of the plurality of database images;

instructions for specifying a plurality of key images specified by a user having common feature values used to specify search conditions;

instructions for comparing the plurality of key images with the plurality of database images to thereby calculate similarities between common feature values of the plurality of key images and the database image feature values;

instructions for retrieving a particular key image from the specified plurality of key images based on the similarities; and

instructions for retrieving images from the plurality of database images based on the similarity between the particular key image and the database images.

25. (Previously Presented) A software program including computer-executable instructions stored on a recording medium as claimed in Claim 24,

wherein the instructions for retrieving include instructions to select as the particular key image one of the plurality of key images which most resembles the database images being searched for.

26. (Previously Presented) A recording medium as claimed in Claim 25, wherein each of said plurality of key images and each of said plurality of database images has a plurality of features associated therewith,

wherein the instruction for comparing includes instructions to calculate a plurality of types of the features from the plurality of key images and then to calculate a degree of similarity by comparing the features of the plurality of key images with respective features of the database images for each type of the feature, and

wherein the instructions for retrieving include instructions for selecting, as the particular key image the key image which most resembles one of the database images with respect to an average value of the similarities for each type of the features.

27. (Previously Presented) A software program including computer-executable instructions stored on a recording medium, said program comprising:

instructions for storing a plurality of database images in an image database, said database images each having a plurality of database image feature values;

instructions for specifying a plurality of key images specified by a user for specifying search conditions, said plurality of key images each having a plurality of features;

instructions for calculating feature values for each of the plurality of key images from the plurality of features for each of the plurality of key images;

instructions for comparing the feature values of each of the plurality of key images with respective feature values of the plurality of database images to thereby calculate first similarities between the feature values of the plurality of key images and the feature values of the plurality of database images;

instructions for selecting a particular key image from the plurality of key images;

instructions for comparing the feature values of the particular key image with the feature values of the plurality of database images to thereby calculate second similarities therebetween;

instructions for calculating a final similarity based on the first and second similarities; and

instructions for retrieving at least one of the plurality of database images, based on the final similarity.

28. (Previously Presented) A software program including computer-executable instructions stored on a recording medium as claimed in Claim 27, wherein the instructions for calculating a final similarity for each of the database images includes instructions for increasing a weighting of the first similarities, to a value greater than that of the second similarities, to thereby calculate the final similarity.

29. (Previously Presented) A software program including computer-executable instructions stored on a recording medium as claimed in Claim 28, wherein the

instructions for calculating include instructions for extracting common features common to all of the key images, and include instructions for comparing those common features with the plurality of database images to thereby calculate the degree of first similarities.

30. (Previously Presented) A software program including computer-executable instructions stored on a recording medium as claimed in Claim 29, wherein the instructions for calculating include instructions for selecting the key images most similar to a desired image.

31. (Previously Presented) An image searching method in an image database system storing a plurality of database images which comprises the steps of:

specifying a plurality of key images specified by a user for specifying search conditions, said plurality of key images each having a plurality of key image features each corresponding to at least one of a plurality of database features, said plurality of key images having a plurality of common features which are common to all of the plurality of key images;

calculating common key image feature values from the common features for each of the plurality of key images;

comparing the common feature values of the common features with corresponding database image features of the plurality of database images to calculate similarities therebetween;

retrieving a particular key image from the plurality of key images based on the similarities such that the particular key image retrieved is the key image which most resembles the database images being searched for; and

retrieving images from the plurality of database images which are most similar to the particular key image based on the similarity between the particular key image and the plurality of database images.

32. (Previously Presented)) A recording medium storing therein a computer-executable image searching program for searching an image database storing a plurality of database images, said program comprising:

specifying a plurality of key images specified by a user for specifying search conditions;

calculating common feature values of the plurality of key images by comparing the plurality of key image features for each of the key images to determine feature values which are common to all of the plurality of key images;

comparing common feature values of the plurality of key images with the database image feature values of the plurality of database images to calculate similarities therebetween;

retrieving a particular key image from the specified plurality of key images based on the similarities; and

retrieving images from the plurality of database images based on the similarity between the particular key image and the plurality of database images,

wherein the particular key image is the one of the plurality of key images which most resembles a desired image.

33. (Previously Presented) An image searching method according to Claim 1, wherein the similarity is determined by satisfying the following three equations:

$$1) FQ_{\text{difference}} = |KIFQ_a - DI_b FQ_a|$$

where $KIFQ_a$ is the key image feature quantity for one of the a number of feature quantities,

where $DI_b FQ_a$ is the database image feature quantity for one of the a number of feature quantities for one of the b number of database images;

$$2) FQ_{\text{distance}} = \sqrt{\sum (FQ_{\text{difference}})^2} ; \text{ and}$$

$$3) \text{similarity} = 1.0/FQ_{\text{distance}}.$$